2. (Original) The method according to claim 1 wherein, in said step of causing, the energy level of the electromagnetic field is caused to vary according to a non-square wave function.

3. (Original) The method according to claim 1 wherein, in said step of causing, the energy level of the electromagnetic field is caused to vary according to a sinusoidal, ramp, or stepped function.

4. (Original) The method according to claim 1 wherein, in said step of causing, the energy level of the electromagnetic field is caused to vary among at least three values each sufficient to maintain the plasma.

5. (Original) The method according to claim 1 wherein, in said step of causing, the energy level of the electromagnetic field is caused to vary periodically with respectively different repetition periods during respectively different time intervals.

6. (Original) The method according to claim 1 further comprising maintaining a cyclically varying gas pressure in the process chamber.

7. (Original) The method according to claim 1 further comprising introducing a first process gas into the reactor chamber during a first time period and introducing a second process gas having a different composition than the first process gas during a second time period which follows the first time period.

8. (Original) The method according to claim 7 further comprising withdrawing substantially the entirety of one of the process gases which has been previously introduced from the reactor chamber before introducing the other one of the process gases into the reactor chamber.

9. (Original) The method according to claim 8 wherein said step of causing the electromagnetic field to vary cyclically is carried out for causing the energy level to have a

first one of the two values during a major portion of the first time period and a second one of the two values during a major portion of the second time period.

10. (Original) The method according to claim 9 wherein said steps of introducing a first process gas and introducing a second process gas are repeated in a cyclic manner.

11. (Original) The method according to claim 10 wherein each time period has a duration of less than 100 msec.

12. (Original) The method according to claim 11 wherein the substrate is a wafer mounted on a chuck and further comprising applying an RF bias voltage to the chuck.

13. (Original) The method according to claim 12 wherein said step of applying an RF bias voltage comprises varying the RF bias voltage cyclically between two values.

14. (Original) The method according to claim 13 wherein the RF bias voltage is varied in synchronism with cyclic variations of the RF field intensity.

15. (Original) The method according to claim 10 wherein, in said steps of introducing a first process gas and introducing a second process gas , each process gas is introduced at a flow rate which varies according to a non-square wave function.

16. (Original) The method according to claim 10 wherein, in said steps of introducing a first process gas and introducing a second process gas , each process gas is introduced at a flow rate which varies according to a sinusoidal, ramp, or stepped function.

17. (Original) The method according to claim 7 further comprising introducing at least a third process gas having a different composition than each of the first and second process gasses during a third time period which follows the second time period.

18. (Original) The method according to claim 7 further comprising maintaining a cyclically varying gas pressure in the process chamber.

19. (Currently Amended) A reactor for performing a plasma-assisted treatment on a substrate, said reactor comprising:

a chamber enclosing a plasma region;

a gas injection assembly immediately proximate the plasma region for delivering a supply of a process gas into the plasma region;

means for creating an RF electromagnetic field in the plasma region, which field interacts with the process gas to create a plasma, the field having an energy level which varies cyclically between at least two values each sufficient to maintain the plasma;

a support member for supporting a substrate in the chamber in communication with the plasma region; and

a vacuum pump communicating with the plasma region for withdrawing process gas at a rate to maintain a selected vacuum pressure in the plasma region~~,~~

~~wherein said gas injection assembly comprises: a gas injection plate provided with a plurality of gas injection nozzles; and a plurality of gas injection valves, each connected for supplying gas to at least one respective one of said nozzles; and valve control means coupled to said valves for causing process gas to be supplied to each of said nozzles in an intermittent manner~~.

20. (Original) The reactor according to claim 19 wherein said gas injection assembly is operative for introducing a first process gas into said chamber during a first time period and introducing a second process gas having a different composition than the first process gas during a second time period which follows the first time period.

21. (Original) The reactor according to claim 20 wherein said valve control means are operative for introducing each process gas into said chamber in the form of pulses.

22. (Original) The reactor according to claim 19 wherein each of said injection valves is an electromagnetic or piezo-electric device.

23. (Original) The reactor according to claim 19 wherein each of said injection valves is connected for supplying gas to a single respective one of said nozzles.

24. (Original) The reactor according to claim19 wherein each of said injection valves is connected for supplying gas to a respective plurality of said nozzles.

25. (Original) The reactor according to claim19 wherein each of said gas injection nozzles is a supersonic injection nozzle.

26. (Original) The reactor according to claim19 wherein said gas injection plate is further provided with a plurality of exhaust orifices through which process gas flows from said plasma region to said vacuum pump.

27. (New) The reactor according to Claim 19 wherein said gas injection assembly comprises:

a gas injection plate provided with a plurality of gas injection nozzles;

a plurality of gas injection valves, each connected for supplying gas to at least one respective one of said nozzles; and

valve control means couple two said valves for causing process gas to be supplied to each of said nozzles in an intermittent manner.